Schenectady County, NY

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Schenectady County AFV Program

- Choice of fuel: CNG
- Original funding assistance
  - NYSERDA, DOE, Petroleum Overcharge Funds
    - 12 After-market conversions
    - 1 Fast-fuel station
- Continuing funding assistance
  - NYSERDA, ICLEI (International Council for Local Environmental Initiatives)

Present Fleet

- 31 CNG vehicles
  - Bi-fuel: cars, vans, pickups
  - Dedicated: vans, forklift
  - Dual –fuel technology:
    - 42,000 lb GVW dump truck
    - 30,000 lb GVW fuel truck


SCHENECTADY COUNTY CLEAN AIR VEHICLE
POWERED BY NATURAL GAS

Fueling Infrastructure Present

- 110 CFM Compressor flow rate
- 125 HP Electric motor
- 220 CFM Dryer
- 88 GGE Storage
- Twin hose dispenser 3,000/3,600 PSI
- Petro-Vend K-800 security system
- Expandable design
- Self-regeneration gas dryer


SHUTOFF
VALVES


3600 PSI
3000 PSI
2144

Fueling Infrastructure Future

- 25 CFM Compressor
- 45 GGE Storage
- Single hose dispenser 3,000 PSI
- Petro-Vend K-800 security system
- Self-regeneration gas dryer
- Expandable design

Fueling Station Operation

- Listed with New York State Tax and Finance
- Stations are open to both public and private sectors

Operations

- Building
- Diagnostic equipment
- Technical staff


CLEAN NATURAL GAS
3406

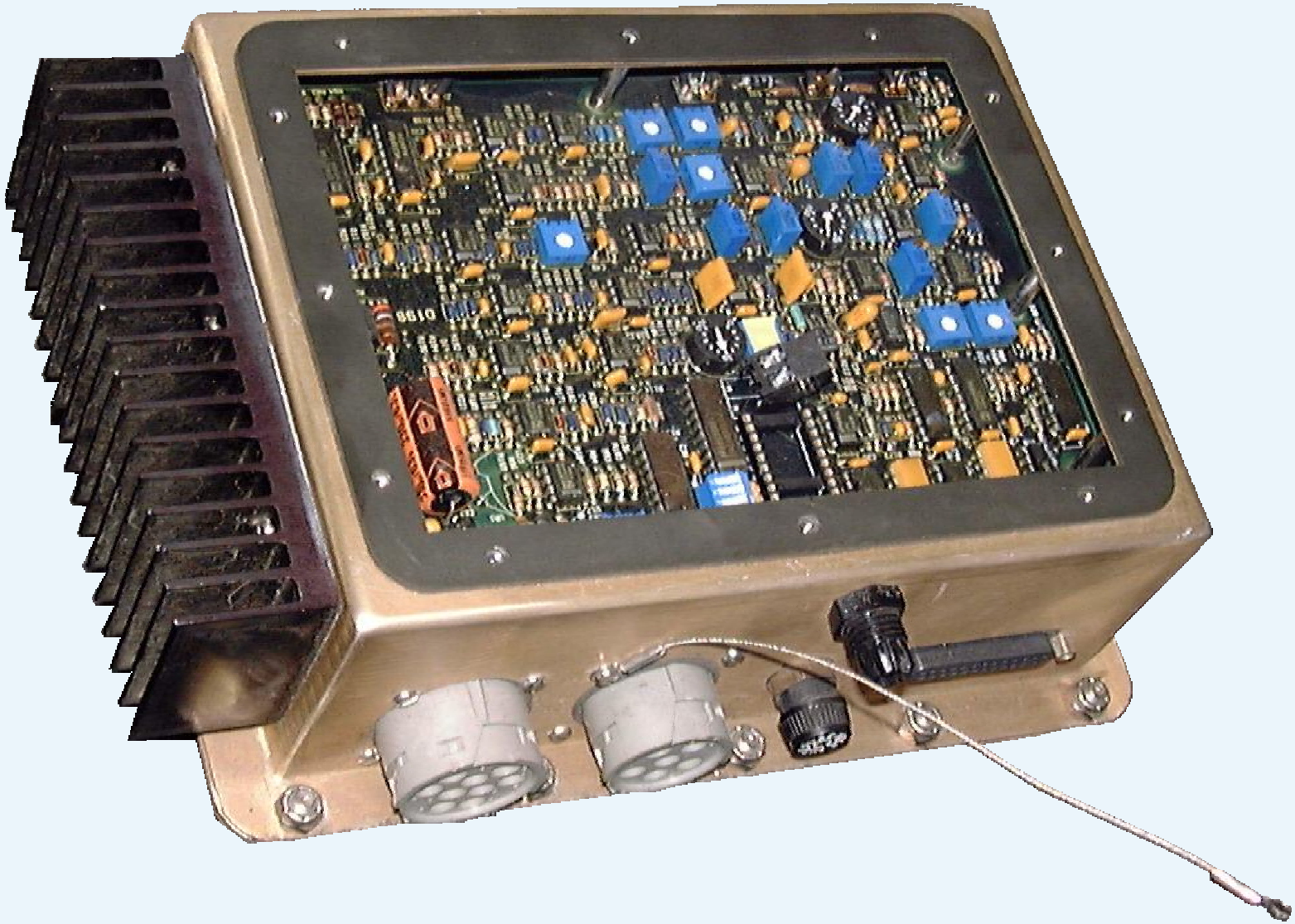
Medium-Heavy Duty Diesel Truck Fleet

- Dual-fuel conversion technology

After Conversion

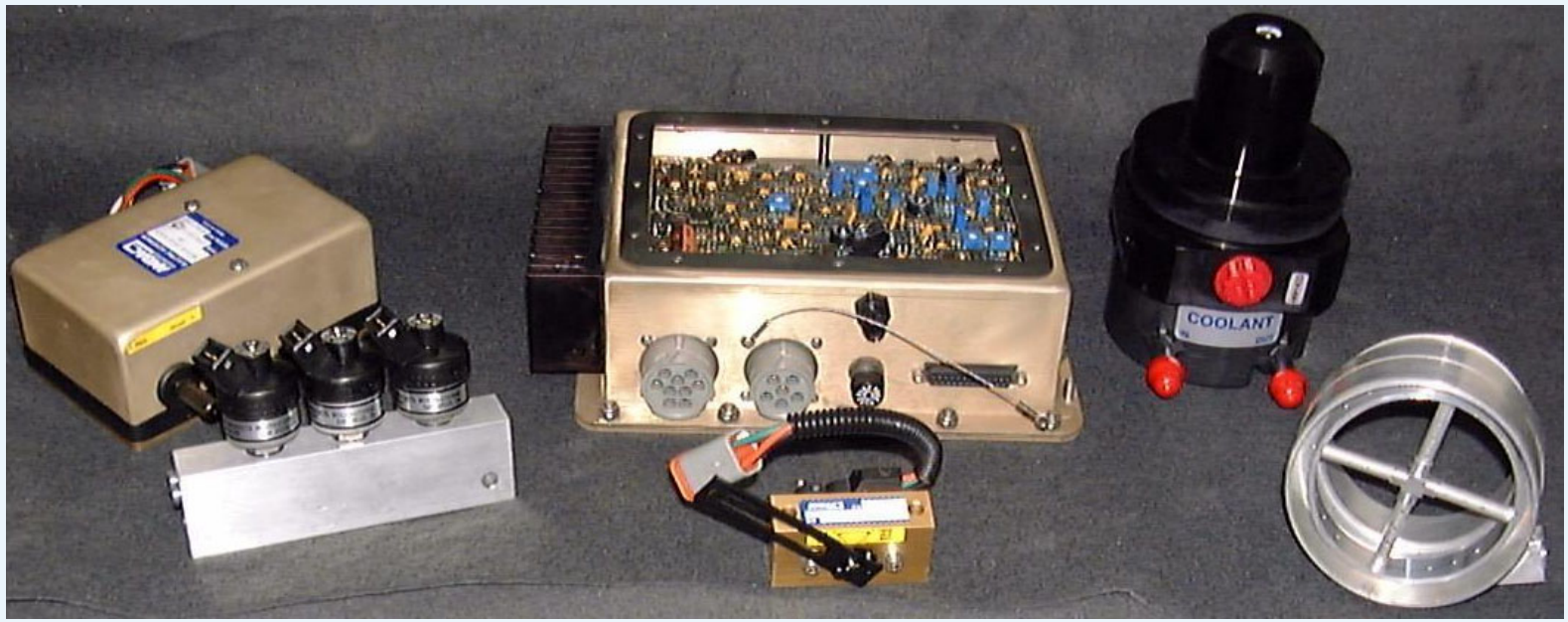
- No modifications made to the engine
- Same power & torque performance
- CNG as primary fuel
- Small amount of diesel used for pilot ignition of natural gas
- Target ratio at maximum load and torque: 80% natural gas, 20% diesel
- Conversion takes one day
- NO_x reduced by 50%, virtual elimination of visible smoke

Central Computer Controller



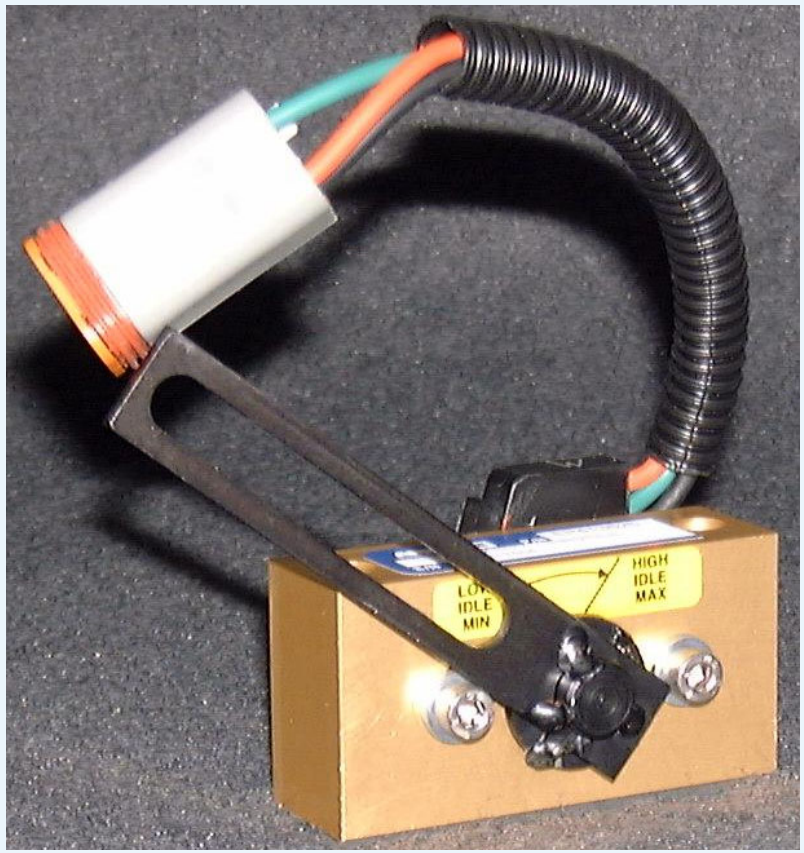
EFC Conversion Components

Twelve main components: central computer controller, natural gas injectors, gas manifold, gas mixer, pressure regulator, gas lockoff solenoids, throttle position sensor, magnetic pickup, exhaust gas temperature thermocouple, diesel pilot actuator, wiring harness, dashboard fuel switch (optional).



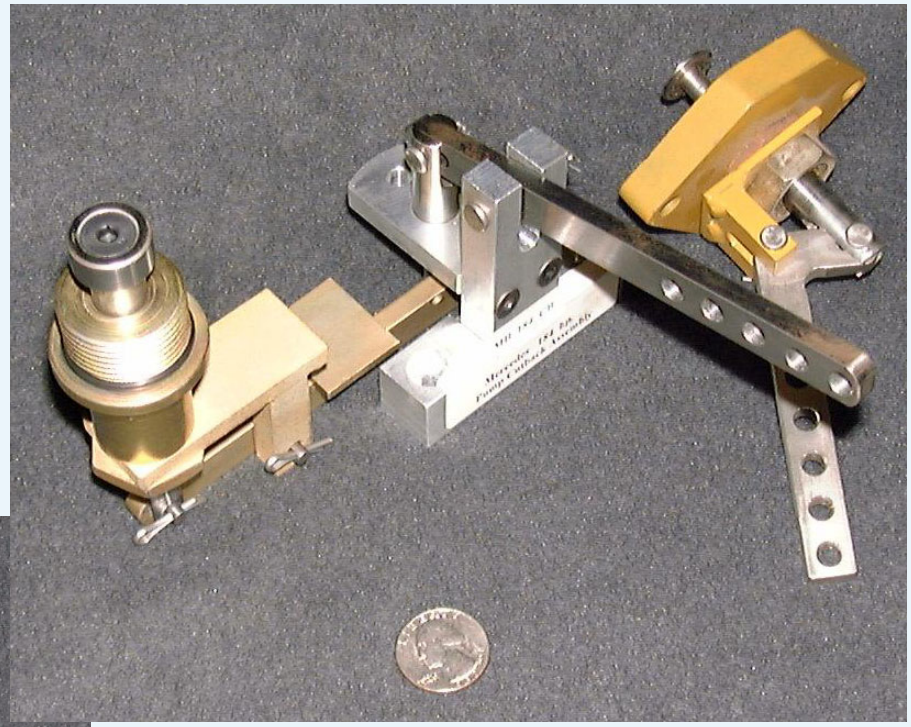
Throttle Position Sensor

Relays information regarding the position of the foot pedal



Diesel Control Assembly

Diesel Cutbacks



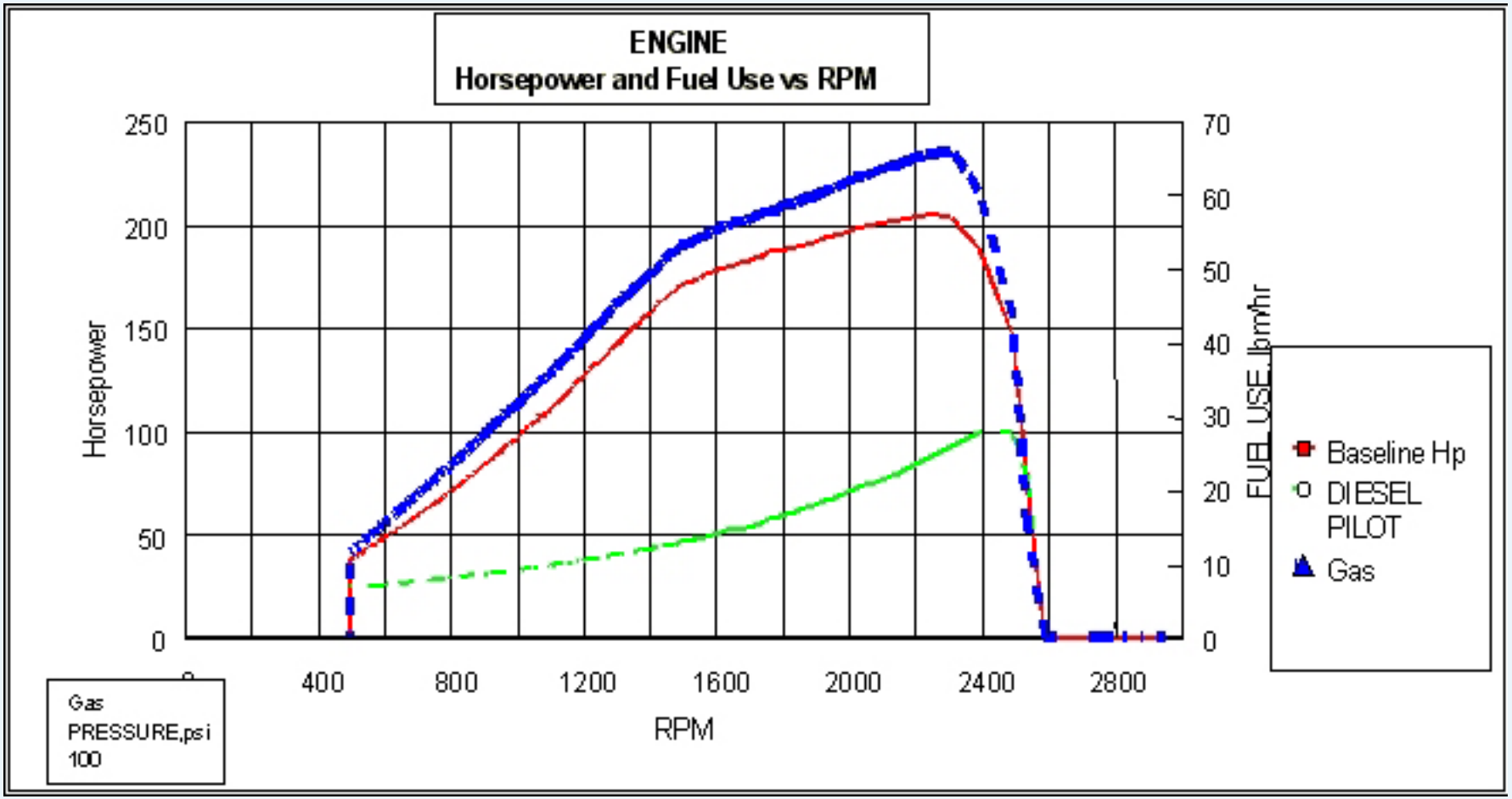
Motor Drive Unit

Ambac Gas Injectors and Manifold

Delivers the exact quantity of gas required to the mixer

Gas Mixer

Thoroughly homogenizes the natural gas and air mixture as it is introduced into the air intake



Natural gas is used during idle. When foot pedal is depressed, natural gas provides all power. Diesel used for pilot ignition of natural gas throughout load curve.


120


22
Clean Air Vehicle
1203


C.N.G. ONLY
120
3

Flexibility of Dual-fuel Technology

- Dual-fuel performance at idle
- Safety net of dual-fuel technology
  - Not dedicated to dual usage

Fuel Comparisons

- CNG - $.8060
- Gasoline - $.9053
- Diesel - $.9058
- Annual CNG usage – 7,500 GGE

Conclusion

- Programs work only with a full circle of cooperation
  - Decision makers
  - Upper management
  - Fleet management
  - Mechanical staff
  - Operators